PATENT CLAIMS

1. Method for providing Quality of Service (QoS) to an Ethernet
switching means connected to a Wide Area Network (WAN), which
has at least one bandwidth limited channel, wherein a total IP
data throughput of voice-, video- and/or other real time applica-
tions or services together with none real time applications or ser-
vices are provided by use of IP data packages, characterised in
that the Ethernet switching means is logically connected to an
Adaptive Quality of Service (AQS) means and that the method
comprises following steps: .
    - acquisition of the Quality of service information carried in the
    RTP/RTCP data packages (step 110; 126);
    - comparing at least one QoS value Q_n, each Q_n is based on the
    Quality of service information from the RTP/RTCP data packages,
    to a corresponding QoS acceptance ratio (step 112; 128);
    - filtering when at least one QoS value has an unacceptable level
    to said corresponding QoS acceptance ratio (step 114; 130).

2. A method according to claim 1, characterised in that the method
comprises following steps:
    - acquisition of a value (TB) for the instantaneous used bandwidth
    of the total IP data throughput (step 102; 122);
    -comparing the used bandwidth value (TB) of the total IP data
    throughput to a minimum value m (step 104; 104);
    - acquisition of the Quality of service information carried in the
    RTP/RTCP data packages (step 110; 126), if the total data
    throughput exceeds the minimum value m.

3. A method according to claim 1, characterised in that
    - acquisition of QoS-values carried by the passing RTP/RTCP data
    packages of voice-, video- and/or other real time applications or

services;

- comparing the QoS-values for packages loss ratio, jitter ratio and/or maximum delay with corresponding QoS acceptance ratio.

4. Method according to claim 1, characterised in that the filtering is stopped, if the used bandwidth value (TB) of the total IP through-put declines a deactivation threshold value (F_d) .

5. Method according to claim 1, characterised in that the filtering is stopped, if at least one of the QoS values is acceptable (step 116; 132).

6. Method according to claim 1, characterised by step of controlling the filtering means according to configurable filter criteria, causing the filtering means to be capable of filtering adaptively the total IP data throughput stream depending on port, MAC-address, IP-address, session-ID or other criteria.

7. Method according to claim 1, characterised by the steps of setting the controlling means in either of two operation modes:
- a first mode - Simple mode - when at least one of the QoS values is found to be not acceptable, or
- a second mode - Advanced mode - when all QoS values are found to be not acceptable.

8. Method according to claim 4, characterised in that the deactiva-tion threshold value (F_d) is a predefined available throughput buffer level.

9. Method according to claim 4 or 5, characterised by using a prede-fined time period (t) from the time point when the declining of the

minimum value (m) was detected before deactivating the filtering process.

10. A method according to claim 2, characterised in that the minimum value (m) is configured to be equal to or less than the guaranteed minimum bandwidth (GMB) of the WAN.

11. A method according to claim 3, characterised in that the filter deactivation threshold value (F_d) is configured to be equal to or less than the minimum value (m), where the minimum value (m) is a positive number.

12. A method according to claim 2, characterised by the step of acquiring and analysing the QoS information of the RTP-header fields of the downwards packages and the QoS information of the RTCP Sender Report and/or Receiver Report on the WAN.

13. A system (12) for providing Quality of Service (QoS) to an Ethernet switching means (22) connected to a Wide Area Network (WAN), which has at least one bandwidth limited channel, wherein a total IP data throughput stream of voice-, video- and/or other real time applications or services together with none real time applications or services are provided by use of IP data packages, characterised in that, said Ethernet switching means (22) is logically connected to an Adaptive Quality of Service (AQS) means (24), which includes acquisition means (34) and comparing means (36) of a monitoring means (28) being capable of identifying an unacceptable QoS level based upon the monitoring of Quality of Service information carried in RTP/RTCP data packages and indicating said unacceptable QoS state to a filter controlling means (30) that controls a filtering means (32) for filtering the total IP data throughput stream.

14. A system (12) according to claim 13, characterised in that the Adaptive Quality of Service (AQS) means (24) comprises second acquisition means (34b) for acquisition of the Quality of service information carried in the RTP/RTCP data packages, second comparing means (36b) for comparing at least one QoS value (Q_n), which is based upon the Quality of service information carried in the RTP/RTCP data packages, to a corresponding QoS acceptance ratio, and filtering means (32) for filtering the total IP data throughput stream, when at least one QoS value (Q_n) has an unacceptable level compared to said corresponding QoS acceptance ratio.

15. A system (12) according to claim 14, characterised in that the Adaptive Quality of Service (AQS) means (24) also comprises a first acquisition means (34a) for acquisition of a value (TB) for the instantaneous used bandwidth of the total IP data throughput stream and first comparing means (36a) for comparing the bandwidth value (TB) to a minimum value (m).

16. A system (12) according to claim 15, characterised in that the second acquisition means (34a) for acquisition of the Quality of service information carried in the RTP/RTCP data packages is activated, if the bandwidth value (TB) exceeds the minimum value (m).

17. A system (12) according to claim 15, characterised in that, the first comparing means (36a) comprises the minimum value (m), that is possible to configure to be equal to or less than the guaranteed minimum bandwidth (GMB) of the WAN.

18. A system (12) according to claim 16, characterised in that, the first comparing means comprises a filter deactivation threshold

value (F_d), possible to configure to be equal to or less than the
minimum value (m, which is a positive figure).

19. A system (12) according to claim 15, characterised in that the first
comparing means (36a) disables the filtering means (32) and said
controlling means (30), if the bandwidth value (TB) declines the
deactivation threshold value (F_d).

20. A system (12) according to claim 13, characterised in that the filter controlling means (30) controls the filtering means (32) according to configurable filter criteria, causing the filtering means (32)
to be capable of filtering adaptively among the total IP data
throughput depending on port, MAC-address, IP-address, session-ID or other criteria.

21. A system (12) according to claim 14, characterised in that the
second acquisition means (36b) acquires and analyses the QoS information of RTP-header fields of the downwards packages and the
QoS information of the RTCP Sender Report and/or Receiver Report on the WAN.

22. A system (12) according to claim 14, characterised in that the
controlling means (30) operates in either of two modes:
- a first mode - Simple mode - when at least one of the QoS values
Q_n is found to be not acceptable; or
- a second mode - Advanced mode - when all QoS values Q_n are
found to be not acceptable.

23. A system (12) according to claim 13, characterised in that the filtering means (32) is deactivated, when the QoS values Q_n for
packages loss, optional jitter and delay are detected by the second
comparing means (36b) to be within an acceptable range.

24. A system (12) according to claim 15, characterised in that the
controlling means (30) deactivates the filtering means (32) a prede-
fined expiration time period (t) from the time point when the de-
5   clining of the minimum value (m) was detected.

25. A system (12) according to claim 13, characterised in that the de-
vice comprises a gateway (26).

10   26. A system (12) according to claim 13, characterised in that the
Adaptive QoS means (24) comprising monitoring means (28) for
monitoring the total IP data throughput on the switch based ag-
gregation system (12), the filtering means (32) being capable of fil-
tering the total IP data throughput and the controlling means (30)
15   for controlling said filtering means (32) depending on the monitor-
ing of the total IP data throughput on the switch based aggrega-
tion system (12) and filter criteria, said all means and filter criteria
may be implemented as computer program and computer readable
code stored on a computer readable product or in a computer
20   readable storage for processing in a specialised computer, server,
personal computer, Digital Processor, Central Processing Unit, etc.

27. A system (12) according to claim 26, characterised in that the
computer program may be loaded to the AQS (24) from a server
25   (38) as a FTP (general File Transfer Protocol) file transfer, TFTP
(Trivial File Transfer Protocol) or other transfer protocol suitable
for computer program transfer and a Management Platform (40)
may remotely control the AQS means (24) and the Switch Based
Aggregation system (12) and configure the AQS means (24) with
30   jitter ratio, Packet (Packages) Loss ratio, Packages delay, filter
method, filter criteria, activation upstreams and/or downstreams.

28. A computer program product directly loadable into an internal memory storage of a processing unit within the computer means, comprising the software code means for performing the steps of any claims 1-12.

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29. The computer program product can be stored on a computer usable medium, comprising readable program for causing a processing unit in a computer means to control an execution of the steps of any of the claims 1-12.

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